

Solving systems using elimination

1. Choose one variable in the system to create opposites. ($15x$ is the opposite of $-15x$) You may need to multiply one (or both) of the equations by a number to create opposite numbers.
2. Once you multiply and create opposites, ADD the two equations together. One of the variables should be eliminated now (canceled out)
3. Solve the new equation. You may get something like: $x=4$. Once you find what number the remaining variable is equal too, then you can substitute that number into one of the original equations to find the other variable.

Ex: Solve by using elimination

$$\begin{array}{rcl} 2(2x - 3y = 20) & \rightarrow & 4x - 6y = 40 \\ +3(11x + 2y = -1) & \rightarrow & 33x + 6y = -3 \\ \hline & & 37x = 37 \\ & & \underline{37} \quad \underline{37} \\ & & x = 1 \end{array}$$

$$2x - 3y = 20$$

$$2(1) - 3y = 20$$

$$\begin{array}{r} 2 - 3y = 20 \\ -2 \qquad \qquad -2 \end{array}$$

$$\begin{array}{r} -3y = 18 \\ \hline -3 \qquad -3 \end{array}$$

$$y = -6$$

$$\text{Solution} = (1, -6)$$